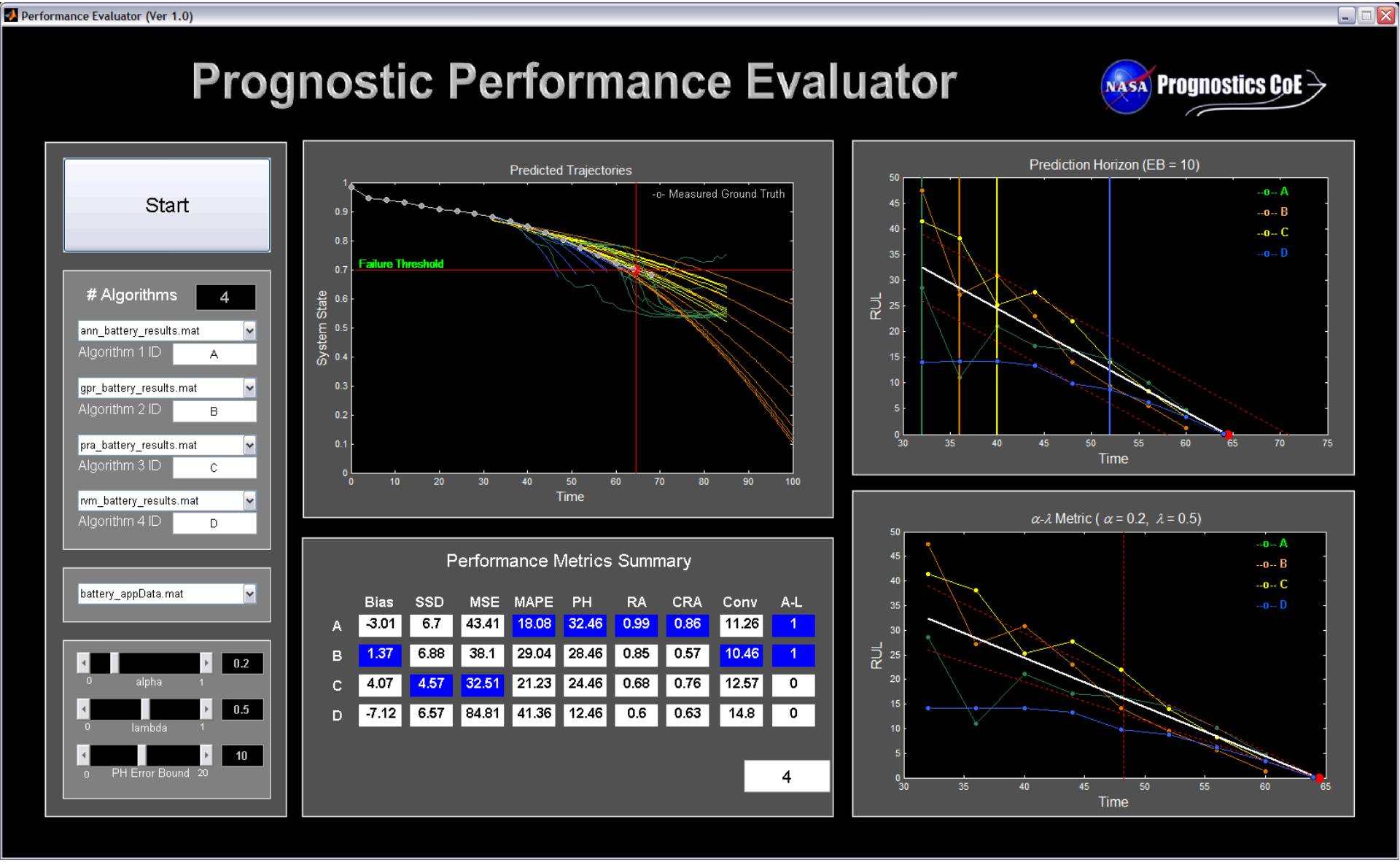
Performance Evaluation Tool (v1.0)

- 9 Performance Metrics
  - 4 classical metrics
    - Bias, Standard Deviation, Mean Squared Error (MSE), and Mean Absolute Percentage Error (MAPE)
  - 5 prognostic performance metrics
    - Prediction Horizon, Relative Accuracy, Cumulative Relative Accuracy, Convergence, and α-λ Accuracy
- Compares up to 4 different algorithms
  - User can specify results file from the algorithms of their choice
- Ranks algorithms
  - Indicates the best algorithm based on all 9 metrics individually
- 3 Plots
  - Plots Prediction Horizon and α-λ accuracy
  - Also plots prediction trajectories for visual assessment
- 3 Performance parameters
  - User can vary the performance parameters as they like and see the effects on performance results
- Plug and Play
  - Modular design lets user to modify the metrics definition
  - Also possible to include other metrics with simple modifications

- Results file for each algorithm to be compared
  - Prediction trajectory
  - Prediction time indices (t_p)
  - (optional) Prediction PDFs for predictions made at every t_p
  - Estimated RUL values for each prediction
- Ground truth data for the application
  - EoL point
  - Failure Threshold
  - Time vector
  - Time indices (t_p) where predictions are asked for
- Performance parameters
  - Alpha – accuracy modifier for *α-λ* accuracy, RA, and CRA
  - Lambda – time window modifier
  - Beta – confidence modifier (to be incorporated with distributions)
  - PHEB – accuracy modifier for Prediction Horizon

Performance Evaluator GUI



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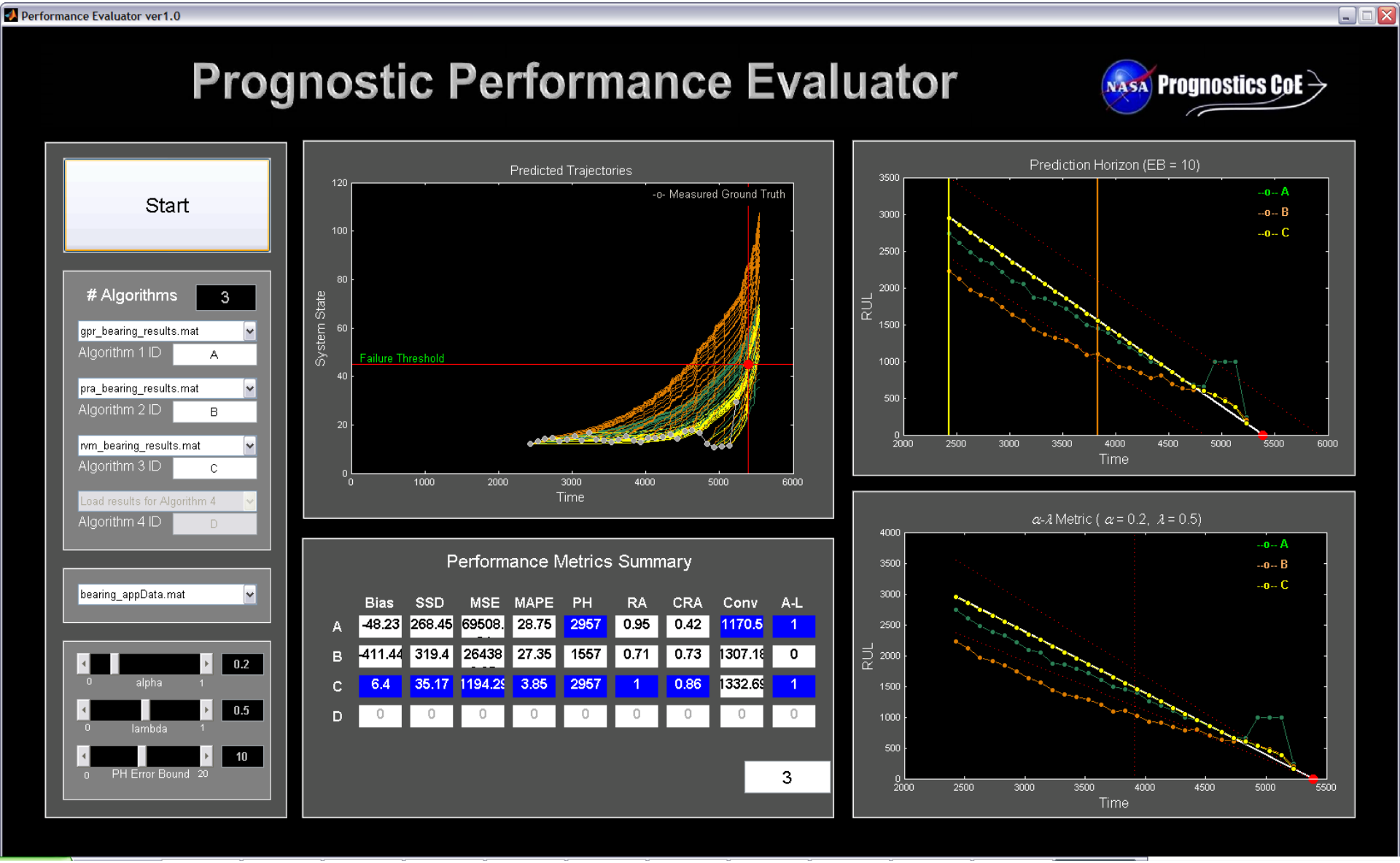

- Add more functionality
  - Incorporate new metrics definition with probability distributions
  - Complete ranking of algorithms by each metric
  - A combined weighted ranking based on all metrics
    - Weighting scheme will be specified by the user
  - Ability to print plots
  - Flexibility to accept data in other formats as may be needed